FIG 9A & 9B show the use of a braid BRIDGE. The braid BRIDGE 91 is advanced to the fracture in a stretched state with a diameter less than its natural, unstretched diameter. When it is released from the delivery device 92, the braid BRIDGE 93 expands to a state of greater diameter. As it expands to a greater diameter it naturally shortens in length. This simultaneously draws the fracture together and fixates the fracture.
The devices in FIGS 8 and FIG 9 can utilize other geometries that function similarly with similar results. In addition, shape memory materials that exhibit similar change of length and diameter may be used in the construction of devices in Fig 8 and Fig 9.

Fig. 10 shows the BRIDGE 100 invention including the use of external screws 101 that join the BRIDGE through the bone. This provides an extra measure of securement and strength.
Fig. 11 shows external plates 110 incorporated with this combination of external screws 111 and BRIDGE 112. There maybe fractures that require the additional stabilization that this combination provides.
Fig. 12A shows an implanted bridge 120 connected to an electrical generator 121 in order to expedite bone growth. The external screws in Fig. 10 can serve the dual purpose of adding securement and acting as electrodes 122.
Fig. 12B shows a device 123 similar to that in Fig. 5 that is connected to an electrical generator 124. In this scenario, the BRIDGE can be used is in a temporary or permanent fashion. It may be desirable to remove the BRIDGE after the bone has healed.

Fig. 13 shows a expansion device 130 that uses a rubber sleeve or grommet 131 that when compressed axially 132, expands radially 133.

It should be apparent that various modifications might be made to the devices and methods by one of ordinary skill in the art, without departing from the scope or spirit of the invention.

WHAT IS CLAIMED IS:

1. A device system for treating bone fractures comprising:
an expandable device for occupying space within bones;
a means of expanding the device;
whereby the expanded device mechanically fixates the fracture.

2. The device system of Claim 1 wherein the means of expanding the device is an inflatable catheter

3. The device system of Claim 1 wherein the means of expanding the device is an axially compressed elastomeric grommet which expands radially when compressed

4. The device system of Claim 1 wherein the means of expanding the device is the inherent spring force contained within the structure of the expandable device

5. The device system of Claim 1 wherein the means of expansion is self-contained within the expandable device

6. The device system of Claim 5, wherein the means of expansion is a relative movement of the opposing ends of the device

7. The device system of Claim 1, wherein the expanded device is substantially tubular

8. The device system of Claim 1, wherein the expanded device has a substantially cylindrical cross-section

9. The device system of Claim 1, wherein the expanded device joins separated bone segments

10. A method for treating bone fractures comprising;
utilizing an expandable device for occupying space within a bone segment;
creating an access hole in bone;
disposing the structure upon a delivery device;
inserting the structure within the bone segment;
advancing the structure to the desired location within the bone segment;
activating a portion of the delivery device in order to cause expansion of the structure.

11. A method of Claim 10, to further include deactivating the delivery device and removing from the bone segment

12. A method of Claim 10, including the steps of utilizing a delivery device that has an expandable, inflatable portion whereon the expandable device is disposed; and the expansion of the expandable device is accomplished by the inflation of the expandable, inflatable portion of the delivery device.

13. A method of Claim 10, including the steps of utilizing a delivery device that has an expandable portion whereon the expandable device is disposed; and the expansion of the expandable device is accomplished by the compression of the expandable portion of the delivery device.

14. A method of Claim 10, wherein the expandable devices are generally tubular in structure and plastically deformed in order to maintain expanded diameter

15. A method of Claim 10, wherein the expandable devices are generally tubular in structure and are mechanically deformed

16. A device for treating bones comprising;
an expandable tubular device;
a delivery device;
said tubular device attached to delivery device; whereby the delivery device expands the tubular device at treatment site, whereby the expanded tubular device joins bone segments.

17. The device as in claim 16 wherein said device is a tubular mesh.

18. The device as in claim 16wherein said device has multiple splines.

19. The device as in claim 16 wherein said device is a coil.

20. The device as in claim 16 wherein said device is a slotted tube.

21. The device as in claim 16 wherein electrical energy is delivered

22. The device as in claim 16 wherein the device has a coating

23. A device for treating fractured bones comprising;
a self-expandable tubular device;
a delivery device;
tubular device within the delivery device;
said device combination advanced to desired location;
said tubular device released from delivery device at desired location; whereby the tubular device expands at treatment site, whereby the expanded tubular device joins and fixates bone fracture.

24. A device as in claim 23, wherein the stress applied to the bone from the radially expanded device enhances healing of the fracture.